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EXAMINER	
MALLARI, PATRICIA C	
ART UNIT	**PAPER NUMBER**
3735	

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,235	WOLF ET AL.	
	Examiner	Art Unit	
	Patricia C. Mallari	3735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *5/1/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45 and 57-64* is/are pending in the application.

4a) Of the above claim(s) *6,10,11 and 34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,8,9,12-19,23,27,28,30-32,35-42,44,45 and 57-64* is/are rejected.

7)☒ Claim(s) *20-22,25 26,33 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

Applicant's election without traverse of Species I, B, C, and F in the reply filed on 5/1/06 is acknowledged. Claims 6, 10, 11, and 34 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim.

Claim Objections

Claims 20, 24, and 39 are objected to because of the following informalities:

On line 1 of claim 20, "claim 1" should be replaced with "claim 8", since claim 8 has sufficient antecedent basis for the limitation "neural sensors" and claim 1 does not.

On line 1 of claim 24, "claim 18" should be replaced with "claim 23" since claim 23 has sufficient antecedent basis for "the preamplifiers" and claim 18 does not.

On line 1 of claim 24, "the preamplifiers include" should be replaced with "each preamplifier includes".

On line 2 of claim 24, "an operational amplifier" should be replaced with "one of the operational amplifiers".

On lines 2-3 of claim 39, "the neural spike detection signal" should be replaced with "the information signal". Appropriate correction is required.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 15 recites, "amplify the neural signals to a level of between about 90 and about 100 decibels". The specification lacks sufficient antecedent basis for this limitation.

Claim 25 recites, " the preamplifier further includes a capacitor connected between the second input of the operational amplifier for reducing DC offset in the neural signal." However, the specification teaches a capacitor 726, shown in figure 7 as being separate from the preamplifier 714, as reducing DC offset, but lacks sufficient antecedent basis for a preamplifier comprising a capacitor for reducing DC offset.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 35 and 36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 35 and 36 recite that the neural spike detector employs differential recording. However, the instant specification describes the signal receiver as

employing differential recording, not the neural spike detector, and further contain no description of a spike detector capable of employing differential recording. It is unclear as to how a spike detector employs differential recording since the signal receiver does the recording, not the spike detector.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 8, 9, 12, 23, 32, 57, 58, and 62 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,275,172 to Ives (herein referred to as Ives '172). Ives '172 teaches a neural spike detection system comprising a signal receiver 12-18 operable to receive a plurality of neural signals comprising a neural spike. A neural spike detector 46 is adapted to communicate with the signal receiver 12-18 and to detect the neural spike in the plurality of neural signals. A transmitter 48 in communication with the neural spike detector is operable to transmit an information signal 50 when a neural spike is detected (fig. 1; col. 2, line 45-col. 3, line 24; col. 4, line 57-col. 5, line 10 of Ives '172).

Regarding claims 8 and 9, the signal receiver includes a plurality of neural

sensors 12 for detecting neural signals from neurons, wherein the sensors are electrodes (fig. 1; col. 2, lines 47-50 of Ives '172).

Regarding claims 12 and 58, the signal receiver 12-18 comprises amplifiers operable to amplify the plurality of neural signals (fig. 1; col. 5, line 14-18 of Ives '172).

Regarding claim 23, preamplifiers 60A-60G comprise operational amplifiers for filtering neural signals (fig. 3; col. 5, lines 32-52 of Ives '172).

Regarding claim 32, the transmitter 48 transmits a pulse when a neural spike is detected in one of the plurality of neural signals, wherein the pulse is event signal 50 (col. 3, lines 17-25 of Ives '172).

Regarding claim 57, 58, and 62, Ives further describes receiving a neural signal comprising neural spikes, detecting occurrences of neural spikes in the signal, and transmitting information indicating the occurrence of a neural spike when a neural spike is detected (fig. 1; col. 2, line 45-col. 3, line 24; col. 4, line 57-col. 5, line 10 of Ives '172).

With further regard to claim 62, one of the neural signals is selected as a reference signal for providing a difference signal between the neural signals and the selected neural signal (col. 4, lines 17-31 of Ives '172).

Claims 1, 8, 9, 12, 27, 28, 32, 57, and 58 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,222,503 to Ives et al. (herein referred to as Ives '503). Ives '503 teaches a neural spike detection system comprising a signal receiver 12 operable to receive a plurality of neural signals comprising a neural spike. A neural spike detector is adapted to communicate with the signal receiver 12 and to detect the

neural spike in the plurality of neural signals. A transmitter in communication with the neural spike detector is operable to transmit an information signal when a neural spike is detected, wherein the computer must include some means for transmitting the waveform data from the buffer to the hard disk and for transmit a signal to illuminate the indicator (figs. 1 & 2; col. 5, lines 17-41; col. 6, lines 5-15; col. 8, line 45-col. 9, line 12 of Ives '503).

Regarding claims 8 and 9, the signal receiver includes a plurality of neural sensors for detecting neural signals from neurons, wherein the sensors are electrodes (col. 5, lines 17-34 of Ives '503).

Regarding claims 12 and 58, the signal receiver 12 comprises amplifiers operable to amplify the plurality of neural signals (fig. 2 col. 6, lines 5-15 of Ives '503).

Regarding claims 27 and 28, the system further comprises a multiplexer 36 for selecting neural signals for transmission (fig. 2; col. 6, lines 5-15 of Ives '503). With further regard to claim 28, a control module is adapted to selectively control the multiplexer for outputting the neural signals for transmission (col. 8, lines 13-15 of Ives '503).

Regarding claim 32, the transmitter transmits a pulse when a neural spike is detected in one of the plurality of neural signals (col. 9, lines 10-12 of Ives '503), wherein the pulse is the signal to illuminate the indicator.

Regarding claims 57 and 58, the description of the system, as given above, inherently discloses a method of operation of the system.

Claims 1, 8, 9, 12, 16, and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,275,172 to John et al. John teaches a neural spike detection system comprising a signal receiver 11a-h, 14a-h, 33, a neural spike detector adapted to communicate with the signal receiver and detect the neural spike in the plurality of neural signals, and a transmitter in communication with the neural spike detector and operable to transmit an information signal when a neural spike is detected (fig. 1; col. 5, line 64-col. 6. line 31; col. 6, line 62-col. 7, line 22; col. 7, line 60-col. 9, line 35 of John), wherein some portion of the microprocessor clearly acts as a transmitter, transmitting the derivation segment to the FFT chip 47 and transmitting a signal to the digital counter 59.

Regarding claims 8 and 9, the signal receiver includes a plurality of neural sensors 11a-11h for detecting neural signals from neurons, wherein the sensors are electrodes (fig. 1; col. 5, line 64-col. 6, line 12 of John).

Regarding claim 12, the signal receiver comprises amplifiers 14a-14h operable to amplify the plurality of neural signals (fig. 1; col. 6, lines 14-42 of John).

Regarding claim 16, the signal receiver comprises filters operable to filter predetermined frequencies in the plurality of neural signals (col. 6, lines 32-42 of John).

Regarding claim 42, an indicator 50, 59 is connected to the neural spike detector and operable to transmit a sensory signal indicating detecting of a sensory input (figs. 1 & 3; col. 8, lines 60-63; col. 9, lines 29-33; col. 12, lines 46-62, col. 14, lines 36-39 of John), wherein detection of an action potential may indicate a sensory input.

Claims 1, 8, 9, 12, 16, 19, 27, 30, 31, 37, 39, and 44 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication No. 2004/0082875 to Donoghue et al. Donoghue teaches a neural spike detection system comprising a signal receiver 110, 210 operable to receive a plurality of neural signals comprising a neural spike, a neural spike detector 220 adapted to communicate with the signal receiver and detect the neural spike in the plurality of neural signals, and a transmitter 250 operable to transmit an information signal when a neural spike is detected (figs. 1 & 2A; paragraphs 22, 23, 27-31, and 33 of Donoghue).

Regarding claims 8 and 9, the signal receiver includes a plurality of neural sensors 112 for detecting neural signals from neurons (fig. 1 of Donoghue), wherein the plurality of neural sensors comprise electrodes.

Regarding claim 12, the signal receiver 210 comprises amplifiers operable to amplify the plurality of neural signals (paragraph 28 of Donoghue).

Regarding claims 16 and 19, the signal receiver comprises filters operable to filter predetermined frequencies in the plurality of neural signals (paragraph 28 of Donoghue). With further regard to claim 19, the filters are operable to filter frequencies between about 500 and 10 kHz (paragraph 28 of Donoghue).

Regarding claim 27, a multiplexer is also provided (paragraph 28 of Donoghue).

Regarding claim 30, the transmitter must inherently include an encoder, since wireless communication, such as Bluetooth®, CDMA, and WAP, require some type of encoding to place the information in a standard format such that the receiver can read the information.

Regarding claim 31, the information signal is a digital signal (paragraph 34, 35 of Donoghue).

Regarding claim 37, the transmitter comprises a radio frequency transmitter (paragraph 35 of Donoghue)

Regarding claim 39, the transmitter is implantable into a subject and further includes transcutaneous telemetry for transmitting the neural spike detection signal outside the subject (figs. 1A & 2; paragraphs 27 and 35 of Donoghue).

Regarding claim 44, a wireless power receiver 266-272 is adapted to wirelessly receive power from a wireless power transmitter 260-264 for powering the system (fig. 2B; paragraphs 36-38 of Donoghue).

Claims 1, 3, 4, 8, 9, 12, 16, 40, 41, 57, 58, and 60 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication 2003/0093129 to Nicolelis et al. Nicolelis teaches a neural spike detection system comprising a signal receiver operable to receive a plurality of neural signals comprising a neural spike (paragraph 94 of Nicolelis), a neural spike detector 10 (data acquisition unit) adapted to communicate with the signal receiver and detect the neural spike in the plurality of neural signals (paragraphs 95, 96 of Nicolelis), and a transmitter in communication with the neural spike detector and operable to transmit an information signal when a neural spike is detected (paragraphs 78, 96 of Nicolelis).

Regarding claims 3 and 4 the neural spike detector 10 comprises a remote device and communicates with the signal receiver via a wireless link (paragraphs 77, 95

of Nicolelis). With further regard to claim 4, the wireless link comprises radio frequency telemetry (paragraphs 167, 172 of Nicolelis).

Regarding claim 8 and 9, the signal receiver includes a plurality of neural sensors for detecting neural signals from neurons (paragraphs 73 and 74 of Nicolelis), wherein the sensors comprise electrodes

Regarding claims 12 and 58, the signal receiver comprises amplifiers operable to amplify the plurality of neural signals (paragraphs 76, 94 of Nicolelis).

Regarding claims 16 and 60, the receiver comprises filters operable to filter predetermined frequencies in the plurality of neural signals (paragraphs 76, 77, 94, 95 of Nicolelis).

Regarding claims 40 and 41, a controller is connected to the neural spike detector and is operable to output control signals in response to detected neural spikes (paragraphs 80, 98, 184, 185 of Nicolelis). With further regard to claim 41, the control signals are transmitted to a mechanical device (paragraphs 82, 83, 110, 111, 186, and 188 of Nicolelis).

Regarding claims 57, 58, and 60, the disclosure of the system of Nicolelis inherently describes a method of operation of such a system, wherein transmission of the information signal must occur when a neural spike is detected in order to allow for actuator motion without observable delay between the encoding of the neural signals and the actuator motion (paragraph 188 of Nicolelis).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue, as applied to claims 1, 8, 9, 12, 16, 19, 27, 30, 31, 37, 39, and 44 above, and further in view of US Patent No. 6,061,593 to Fischell. Donoghue teaches the system being implantable and housed on a single support (Figs. 1 & 3D of Donoghue) but fails to describe teach using a neurochip comprising very large-scale integration (VLSI) architecture. However, Fischell teaches an EEG system wherein a VLSI chip may be used to implement processing portions of the system (col. 22, lines 18-25 of Fischell). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the VLSI chip of Fischell to implement the processing portions of Donoghue, since Donoghue teaches processing portions, and Fischell teaches a VLSI chip as an appropriate means for such processing.

Claims 5 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolelis, as applied to claims 1, 3, 4, 8, 9, 12, 16, 40, 41, 57, 58, and 60 above, and further in view of US Patent Application Publication No. 2003/0025604 to Freeman et al. Nicolelis teaches that the transmitter may use radio telemetry, but is silent as to a type of radio telemetry. However, Freeman teaches a medical device using radio telemetry,

wherein such telemetry may be ultra-wideband radio (paragraph 30 of Freeman). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use ultra-wideband radio as the radio telemetry of Nicolelis, since Nicolelis teaches using radio telemetry, and Freeman describes ultra-wideband radio as an appropriate such form of radio telemetry.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolelis, as applied to claims 1, 3, 4, 8, 9, 12, 16, 40, 41, 57, 58, and 60 above, and further in view of US Patent No. 6,128,527 to Howard, III et al. Nicolelis lacks the remote spike detector being adapted to be worn by the subject. However, Howard, III teaches a neural spike detection system wherein the neural spike detector 444, 630 may either be located away from the patient's body or be of a size and shape for implantation in the neck of a patient, wherein the neck is a remote location from the brain, as shown in figure 8 (figs. 5 & 8; col. 4, lines 25-39; col. 5, lines 13-24 of Howard, III). Therefore, it would have been obvious to one of ordinary skill in the art to make the spike detector of Nicolelis adapted to be worn by the subject as shown by Howard, III, since Howard, III shows either a spike detector not adapted to be worn by the patient or one worn by the patient are functionally equivalent means for detecting neural spikes.

Claims 13 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ives '503, as applied to claims 1, 8, 9, 12, 27, 28, 32, 57, and 58 above, and further in view of US Patent No. 3,924,606 to Silva. Ives lacks a control module adapted to

selectively power the amplifiers for conserving power. However, Silva teaches an EEG acquiring system wherein a controller 28 is provided to selectively power the amplifier and other system components (col. 7, lines 6-17 of Silva). Therefore, it would have been obvious to one of ordinary skill in the art to combine the controller of Silva with the system of Ives in order to allow for power conservation.

Claims 14 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ives '503, as applied to claims 1, 8, 9, 12, 27, 28, 32, 57, and 58 above, and further in view of US Patent No. 3,821,949 to Hartzell et al. Ives '503 fails to describe the amplifiers used in detail. However, Hartzell teaches a signal receiver comprising amplifiers, wherein a control module of the amplifiers selectively controls the amplification of the amplifiers, the sensitivity adjustments 96, 98, 100 constituting the control module (col. 12, line 51-col. 13, line 8 of Hartzell). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the amplification system of Hartzell as the amplifiers of Ives '503, since Ives '503 teaches using some sort of amplifiers, and Hartzell teaches an amplification system having a control module for selectively controlling the amplification of the amplifiers as appropriate such amplifiers in a signal receiver.

Regarding claim 24, the adjustable amplifiers are preamplifiers and the amplifiers and control module comprise a resistor 174, 176 connected between the output and the second input of an operational amplifier having its first input connected to a neural sensor (figs. 2 & 3; col. 13, lines 10-23 of Hartzell).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over John, as applied to claims 1, 8, 9, 12, 16, and 42 above. John lacks the amplifiers being operable to amplify the neural signals to a level of between about 90 and about 100 decibels. However, the applicants have not shown that such a level would solve any stated problem or serves a particular purpose. Moreover, it appears that the claimed apparatus would work equally well with the amplifiers having any reasonable amount of gain. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use amplifiers having a gain of 90 to 100 dB in the system of John, as a mere matter of design choice.

Claims 17, 18, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ives '503, as applied to claims 1, 8, 9, 12, 27, 28, 32, 57, and 58 above, and further in view of US Patent No. 4,478,223 to Allor. Ives '503 teaches using an EMG filter, but is silent as to the details of the filter. However, Allor teaches a bioelectrical signal receiver, wherein the EMG filters are adjustable or selected (col. 3, lines 10-25 of Allor). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the filters of Allor as the EMG filter of Ives '503, since Ives '503 teaches using an EMG filter, and Allor describes an appropriate such filter.

Regarding claim 18, a control module must inherently be included in order to allow an operator to adjust the filters as described (col. 3, lines 10-15 of Allor).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nicolelis, as applied to claims 1, 3, 4, 8, 9, 12, 16, 40, 41, 57, 58, and 60 above, and further in view of US Patent No. 6,061,593 to Fischell. Nicolelis teaches the neural spike detector comprising a data acquisition unit 10 for processing received signals, but is silent as to the architecture of the detector. However, Fischell teaches an EEG system wherein a VLSI chip may be used to implement processing portions of the system (col. 22, lines 18-25 of Fischell). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the VLSI chip of Fischell to implement the neural spike detector of Nicolelis, since Nicolelis teaches processing portions, and Fischell teaches a VLSI chip as an appropriate means for such processing.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue, as applied to claims 1, 8, 9, 12, 16, 19, 27, 30, 31, 37, 39, and 44 above, and further in view of US Patent No. 6,984,205 to Gadzinski. Donoghue is silent as to whether or not the wireless power receiver is adapted to receive a clock signal. Gadzinski teaches an inductive power receiver adapted to receive a clock signal from an inductive power transfer circuit (col. 1, line 43-col. 12, line 15 of Gadzinski). Therefore, it would have been obvious to obvious to one of ordinary skill in the art at the time of invention to combine the inductive power receiver and transfer circuit of

Gadzinski with the system of Donoghue in order to supply a clock signal in order to drive components which may require a clock signal, such as an A/D converter (col. 12, lines 10-15 of Gadzinski).

Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue, as applied to claims 1, 8, 9, 12, 16, 19, 27, 30, 31, 37, 39, and 44 above, and further in view of Nicolelis. Donoghue teaches the transceiver transmitting data based on the output of the spike detection module to an external device but is silent as to whether such transmission is performed when a neural spike is detected and further is silent as to what the external device is.

However, Nicolelis teaches a system wherein a signal from a spike detector is transmitted to circuitry for controlling an actuator, such as a prosthetic limb. The information signal is transmitted upon detection of the spike, in order to allow actuator motion without observable delay between the encoding of the neural signals and the actuator motion (paragraphs 73-82, 94-100, 164-188 of Nicolelis). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the method and device of Donoghue for controlling an actuator, such as a prosthetic limb, as in the method and device of Nicolelis, since Donoghue teaches transmitting data based on spike detection from a transceiver to an unidentified external device, and Nicolelis teaches that such data may be used to control an actuator.

Claim 64 is rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue in view of Nicolelis, as applied to claim 63 above, and further in view of Gadzinski. Donoghue, as modified, is silent as to whether or not the wireless power receiver is adapted to receive a clock signal. Gadzinski teaches an inductive power receiver adapted to receive a clock signal from an inductive power transfer circuit (col. 1, line 43-col. 12, line 15 of Gadzinski). Therefore, it would have been obvious to obvious to one of ordinary skill in the art at the time of invention to combine the inductive power receiver and transfer circuit of Gadzinski with the system of Donoghue in order to supply a clock signal in order to drive components which may require a clock signal, such as an A/D converter (col. 12, lines 10-15 of Gadzinski).

Allowable Subject Matter

Claims 35 and 36 would be allowable if the rejection under 35 U.S.C. 112, 1st paragraph, set forth in this Office action, were overcome and the claims were rewritten to include all of the limitations of the base claim and any intervening claims.

Claims 20-22, 25, 26, 33 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 20-22, the prior art of record fails to teach or fairly suggest a neural spike detection system, wherein the system comprises a multiplexer having an

output and one or more inputs connected neural sensors for selecting a neural signal as a reference signal as the output, and a plurality of operational amplifiers having first and second inputs, wherein the neural sensors are connected to the first inputs of the operational amplifiers and the second inputs are connected to the output of the multiplexer for providing a difference signal between the neural signals of the neural sensors and the reference signal, in combination with all of the other limitations of the claims.

Regarding claims 25 and 26, the prior art of record fails to teach or fairly suggest a neural spike detection system, wherein the preamplifiers include an operation amplifier having a first and second input and an output, wherein the first input is connected to a neural sensor, and a resistor connected between the output and the second input of the operational amplifier and a capacitor is connected between the second input of the operational amplifier for reducing DC offset, in combination with all of the other limitations of the claims.

Regarding claim 33, the prior art of record fails to teach or fairly suggest a neural spike detection system, wherein the transmitter transmits a first and a second pulse when a neural spike is detected on one of the plurality of neural signals, the two pulses being time-spaced by a predetermined length of time for indicating on which of the plurality of neural signals that the neural spike was detected, and further in combination with all of the other limitations of the claim.

Regarding claims 35 and 36, the prior art of record fails to teach or fairly suggest a neural spike detection system wherein the neural spike detector isolates neural spikes

from noise sources by employing differential recording or differential recording and filtering, in combination with all of the other limitations of the claims. US Patent No. 4,846, 190 to John teaches using filtering and differential recording, but it is the signal receiver, rather than the spike detector that employs such techniques (fig. 1; col. 5, line 64-col. 6, line 42 of John). US Patent No. 5,275,172 to Ives also employs differential recording, but, again, the signal receiver employs the differential recording, rather than the spike detector (col. 1, lines 18-26; col. 2, lines 45-56 of Ives '172).

Regarding claim 43, the prior art of record fails to teach or fairly suggest a neural spike detection system, wherein an indicator connected to the neural spike detector is operable to transmit a sensory signal indicating detection of a sensory input, the sensory input being one of touch, sound, light, and chemical stimuli, in combination with all of the other limitations of the claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia C. Mallari whose telephone number is (571) 272-4729. The examiner can normally be reached on Monday-Friday 10:00 am-6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor, II can be reached on (571) 272-4730. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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